Measurement and compliance procedures:

- MSTV and NBC urge the Commission to permit licensees to demonstrate compliance through mathematical calculations and modeling. The Commission should provide a compliance guide, perhaps an updated OST 65, setting forth acceptable methods (8).

Categorical exclusions:

- MSTV and NBC believe that adoption of the 1992 ANSI/IEEE standard does not necessitate substantial revision of existing exclusion criteria (5-7).

- Studio to transmitter links, intercity relays, and microwave booster stations operate at low power and are highly unlikely to exceed uncontrolled environment standards. Narrow beams also reduce exposure (5-6).

- Most remote pickup and low power auxiliaries are not likely to cause exposures exceeding the standard. However, some vehicles with antennas operating at higher power levels (up to 100 watts) may require some restrictions (as to vehicle placement or use of traffic cones) to "avoid RF exposure in excess of uncontrolled limits" (6).

Transitional procedures:

- Existing facilities should be allowed to continue operating and should be required to demonstrate compliance with the new standards only upon the filing of a license renewal or an application for a modification of the existing equipment configuration (7-8).

- The rules should take effect only after guidance on compliance methodology is available (8).

State preemption:

- The Commission should preempt state and local government regulation of RF radiation. The "problem of conflicting regulation has only grown more acute" in the nine years since the Commission addressed the matter (8-9).

Other issues:

- Not addressed.

THE ASSOCIATION OF FEDERAL COMMUNICATIONS CONSULTING ENGINEERS
Comments on RF Environmental Guidelines Amendments
(January 25, 1994)

Interest: Association of registered professional engineers.

Adoption of ANSI/IEEE Standard:

- AFCCE supports the FCC proposal to use a new standard for evaluating the effects of RF exposure, but suggests that the FCC can minimize the burden on broadcasters by developing procedures that permit effective prediction of exposure and definition of threshold exposures above which specific exposure avoidance or reduction methods are required (2).

Induced currents:

- AFCCE supports consideration of induced body currents in relation to field strength as a protection guideline, and recommends that the FCC ascertain field limits below which induced currents need not be considered (10).

Contact currents:

- There are no commercially available instruments that measure contact currents reliably. A reliable, easily understood instrument must be made available for use as an area survey meter or a personal warning meter to test the area around the transmission site. The user would be considered part of the circuit monitoring the current. A reasonable time averaging interval is essential to this methodology (8-9).

- With regard to the VHF contact current upper frequency limit at 100 MHz, AFCCE states that the presence of RF sources above and below 100 MHz at common or closely spaced sites demands that all sources be viewed as potential contact current sources. Either including or excluding all sources could be arbitrary and requires further consideration (9).

Controlled v. Uncontrolled environment:

- AFCCE supports a common sense distinction between these two environments, and urges the FCC to clarify potentially confusing categories such as transient persons and hand held devices. AFCCE recommends a dialogue between the FCC, AFCCE members and other engineers in adopting efficient guidelines (3).

Measurement and compliance procedures:

- Such procedures must be clearly delineated in an OST 65-type publication (7).

- AFCCE states that in cases where measurements indicate that overexposure cannot be avoided the alternative of protective clothing may suffice. Generally, however, active controls, as opposed to passive barriers, are preferred. Instruments designed for general use for exposure monitoring must give reliable and accurate results. A self test and failure alarm, such as that described in the existing OST 65 document, are recommended (7).

Categorical exclusions:

- AFCCE suggests that regardless of whether the exclusion is based on SAR or radiated power, the circumstances of the use should be taken into account (4).

- Manufacturers claiming compliance under the SAR limits should be required to describe the conditions under which compliance is claimed, including the recommended use of the device and the test conditions under which the SAR was determined (4).

- Devices now available must be addressed under the new guidelines. Those that can be excluded based on power need not be examined further. If certification of compliance based on SAR is required, the manufacturer must supply the certification and use instructions in an acceptable time. If compliance cannot be demonstrated, the device must be modified or its use restricted as necessary. Existing uses should be grandfathered to enable compliance with these requirements (4-5).

- AFCCE urges the FCC to review all low power transmission relative to their parameters and to recommend usage for their resulting exposure potential. Categorical exclusion should be allowed for those that pose little or no potential for exposure in excess of the guidelines. Specific examples include hand held devices, motor vehicle mounted devices operating with sufficiently low transmitter powers, low power base station transmitters, and aural STLs with transmitters of 10 watts (4-5).

Transitional Procedures:

- AFCCE recommends that entities be allowed several months to complete FCC applications for new or modified facility permits or licenses. A delay of 60 days would be appropriate for the reworking of applications presently on file (10).

- With regard to operations in progress on the effective date of the new rules, AFCCE suggests that no changes or certifications be required until the operator files an application for change or relicensing. Installations with a high probability of noncompliance must be brought to the attention of the FCC (10).

State Preemption:

- Not addressed.

Other Issues:

- For devices not granted categorical exclusions, a set of concise prediction methods, including an OST 65-type bulletin and formula must be available to broadcasters and engineers (6).

BELL SOUTH CORPORATION, BELL SOUTH TELECOMMUNICATIONS, INC., BELL SOUTH ENTERPRISES, INC. AND BELL SOUTH CELLULAR CORP.
Comments on RF Environmental Guidelines Amendments
(November 23, 1993)

Interest: "Bell South" comments from the perspective of a "future PCS (Personal Communication System) provider" (1).

Adoption of 1992 ANSI/IEEE Standard:

- "Supports adoption of the 1992 ANSI/IEEE standard, with clarifications" as serving "the public interest by minimizing potential hazards" (1).

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- Time averaging of power (rather than using only peak power) should be permitted in testing for low power exclusion because time-slicing techniques used in conjunction with digital transmissions "result in a mean power level that is considerably lower than peak power" (5).

- FCC should recognize "qualified testing laboratories" for "testing for SAR compliance" of "most mobile units" and "some transportable units," as well as "PCS subscriber equipment" (unless the requested low-power exclusion extension to 2 GHz is granted) (6-7).

- Mobile and portable equipment for consumer installation should be subject to "mandatory criteria for installation that would ensure compliance," accomplished "through the type acceptance process" (8).

Categorical exclusions:

- Urges extension of low power exclusion "beyond 1500 MHz to the 2 GHz PCS bands," as FCC is considering, so that, after "PCS networks are operational," PCS equipment manufacturers can "eliminate any unnecessary expense" in "marketing to cost-conscious consumers" (3-4).

- Part 22 and Part 90 categorical exclusions should exist for "base station equipment meeting the standards for hand-held devices" and other base station facilities "located at a specified distance from areas accessible to the public" (7-8)

Transitional procedures:

- If the requested "clarification" of the standard to extend the low-power exclusion up to 2 GHz "cannot be obtained promptly, however, Bell South urges the Commission not to allow its adoption of the ANSI/IEEE standard to be delayed" (4).

State preemption:

- Not addressed.

Other issues:

- Not addressed.

BROADCAST SIGNAL LAB
Comments on RF Environmental Guidelines Amendments
(November 11, 1993)

Interest: Cambridge, Massachusetts firm that provides compliance "measurement services to New England area broadcasters, cellular operators, and communications facility managers" (1).

Adoption of 1992 ANSI/IEEE Standard:

- The standard reflects "the strongest body of science" and is "conservatively designed," but it "is not entirely realistic to implement," is "more burdensome than necessary," and "will only compound the fears and misperceptions of the public" (1-2).

Induced currents:

- The 100 MHz cut-off is arbitrary; that being the case, why not set one at a frequency that has far less critical impact on FM broadcasters? (4)

- See measurement and compliance procedures.

Contact currents:

- See measurement and compliance procedures.

Controlled v. Uncontrolled environment:

- In Massachusetts, we have been dealing with "public" vs "occupational" exposure limits similar to those proposed. Generally, there has been no significant burden to broadcasters with respect to controlling access to areas above the public exposure limits (2).

- With respect to non-technical personnel, it is sensible to choose the uncontrolled environment limits "where there is any question of possible exposure of the general public (which might include the non-technical employee) . . ." The difficulty in interpretation occurs when the environment is one with distributed responsibility (3).

- Clear guidelines must be set on what constitutes reasonable exercise of control and reasonable notification to other parties. The phrase "where there is any question of possible exposure . . ." could be interpreted broadly to include the vandal who uses extreme measures to penetrate a well-marked security fence or the landscaping

contractor whose employee climbs a well-marked high fence to spread some pea stone around a live AM tower. Without a definition of the Commission's expectations for control, all environments could end up in the uncontrolled category (3).

Measurement and compliance procedures:

- Hammett and Edison have spoken well about the inconsistencies of current measurements as presented in the standards. BSL would underscore the impracticality of taking measurements of a variety of induction and contact geometries and body types on a tower, roof, or in other facilities (5).

- There is nothing more counterproductive than having someone go through the motions of measuring something extra just to meet a requirement. BSL is concerned that the implementation of this body current standard is not demonstrably practical and would result in additional burdens on many users of the RF spectrum (5).

- BSL suggests that between 30 MHz and 100 MHz a standard for presumptive compliance be established. For instance, if the exposure conditions on the ground meet uncontrolled environment standards, and a tower climber has clear limits set for controlled power density exposure, we might presume the body current standard would be met. Of course, with a little study, other conditions and limits might apply (5).

- The RF generator, by virtue of his license, is responsible for the safe operation of his facility. There is no practical incentive for any others to cooperate with the RF generator as long as the burden is only on his license. This places the RF generator in potentially no-win situations unless he owns the property on which he is generating RF (3).

Categorical exclusions:

- BSL feels the burden of compliance must be shared among all users of the spectrum, saving exclusions for narrowly-defined devices, under specifically implemented and controlled circumstances (3).

Transitional procedures:

- Not addressed.

State preemption:

- Not addressed.

Other Issues:

- The more complicated, the more exception-oriented, the more arcane a standard is, the less good it will do in assuring the public that they are getting a fair deal from their regulators and businesses. The unsettling fact for any citizen is that the FCC adopted a standard in the 1980's, and now we are in the process of adopting a more conservative one. Are we being too cavalier with the public safety? BSL has been confronted with questions like this (6).

CBS INC., CAPITAL CITIES/ABC INC.,
GREATER MEDIA, INC., TRIBUNE COMPANY
AND WESTINGHOUSE BROADCASTING COMPANY, INC.
Comments on RF Environmental Guidelines Amendments
(January 25, 1994)

Interest: These "Broadcast Joint Commenters" all operate extensive television and/or radio broadcast facilities.

Adoption of ANSI/IEEE Standard:

- They support reliance on the ANSI/IEEE standard, as opposed to other standards, and stress the importance for broadcast facilities of the controlled environment's "transient passage" concept (12-17).

- The 1992 ANSI/IEEE standard, in adopting a two-tiered exposure regime, represents a desirable prophylactic measure to provide an extra margin of safety beyond what existing science supports (4).

Induced currents:

- The proper frequency ranges for applying the induced current standard should be clarified; 100 MHz may not be the scientifically correct upper bound, and it causes economic problems because it falls in the middle of the FM band (30-31).

- The FCC should clarify the induced current controlled environment standard to permit transient exposure (as well as informed worker exposure) so that averaging is done over 6-minute intervals rather than one-second periods. Permitting only instantaneous exposure is inconsistent with the general exposure rule which recognizes heating of tissue is not instantaneous (27-30).

Contact currents:

- See measurement and compliance procedures.

Controlled v. Uncontrolled environment:

- The controlled and uncontrolled environments concept is one of the most important aspects of the new ANSI/IEEE standard. The concept of transient exposure of the public as part of the controlled environment standard is particularly important to broadcasters. It accommodates the reality that the public occasionally has access to areas around broadcast facilities without subjecting such transients to appreciable risk (12-16).

- The transient exposure concept is a feature which makes the ANSI/IEEE standard more appropriate for FCC use in regulating broadcasters than the other standards noted in the NPRM (15-17).

Measurement and compliance procedures:

- Broadcasters (not being categorically exempted) have borne the greatest regulatory burden under the existing regulations and will likely face increased responsibilities under the 1992 standard, as the NPRM acknowledges. Consequently, they stress the need for clear, reliable and feasible compliance procedures, such as have been embodied in the OST 65 compliance bulletin (7-12).

- They are concerned about compliance procedures related to the "induced current" standards and "contact current" standards because those are new, measurement technology is in its infancy, and there are no established compliance verification models or rules. They submit it is premature to require compliance with these standards (18-34).

- NAB's analysis of laboratory data reflecting "worst case" scenarios has not yielded any satisfactory "safe harbor" compliance rules, but preliminary measurement tests by CBS suggest that, in actual broadcast facilities, compliance with the basic field exposure rule may be sufficient to protect against induced currents. Further work is needed to specify reliable measurement techniques and "adopt reality-based safe harbors" using measurements made with those techniques (20-26).

- The contact current standard poses measurement challenges that are even more difficult, and are complicated by the potential to energize objects such as construction cranes located as much as half a mile from an AM tower. Also measurements would be valid only for the moment taken since the configuration of such non-broadcast structures changes frequently (32-33).

- Rather than requiring contact current measurements, the FCC should deem broadcasters to be in compliance "as to tower workers and climbers if such workers wear protective gloves and suits" and assume compliance otherwise where "the ANSI/IEEE requirements as to MPE are met" (33-34).

- The FCC should maintain a shared compliance responsibilities rule at multiple transmitter facilities (40).

- Manufacturers of new broadcast auxiliary equipment that comes with a permanently installed antenna should establish controlled and uncontrolled set-off zones that OST 65 and broadcasters can use (38-39).

- No additional compliance "paperwork should be required of broadcasters beyond their "certification" that renewal would not involve a "major action" for NEPA purposes (39-40).

Categorical exclusions:

- Not addressed.

Transitional procedures:

- After the measurement/compliance problems are resolved the Broadcast Joint Commenters recommend "a transition period of two years after the revised version of Technical Bulletin OST 65 is released before it begins enforcement of the new policies as to broadcasters and other licensees" (37-38).

State Preemption:

- The FCC should prevent federal policies encouraging growth in the use of radio from being slowed by inconsistent state and local regulation (40-42).

- Since such regulation now threatens important federal policy goals, including the introduction of High Definition Television, the FCC, simultaneously with the release of its Report and Order on the revised ANSI/IEEE standard should issue a further notice of proposed rulemaking addressing preemption of "inconsistent state and local RF exposure regulations" (42-46).

Other issues:

- Not Addressed.

CELLULAR TELECOMMUNICATIONS INDUSTRY ASSOCIATION

Comments on RF Environmental Guidelines Amendments
(January 25, 1994; see "Other Issues")

Interest: Trade association whose members include Commercial Mobile Service providers, wireless equipment manufacturers, support service providers and others with an interest in the wireless industry.

Adoption of 1992 ANSI/IEEE Standard:

- Supports the FCC's proposals because the newly adopted 1992 ANSI/IEEE standards are sound and scientifically-based and provide the basis for the safe use of the vast array of radio products that are becoming commonplace. (2-3)

- With regard to the applicability of other existing standards, CTIA believes reliance on the ANSI/IEEE 1992 standard is in keeping with past FCC practice and would minimize transition costs and mirror the IEEE's progress in developing RF exposure guidelines based on all relevant scientific learning on this subject. (5-6)

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- Supports both the controlled and uncontrolled environment exposure recommendations. (4)

Measurement and compliance procedures:

- Believes that SAR compliance can best be accomplished by incorporating it as a requirement of the FCC's radio type acceptance process. (6)

- Recommends that the FCC require only that the type acceptance applicant indicate affirmatively that the SAR was measured in accordance with approved procedures and that the unit meets the FCC's requirement. (6)

Categorical exclusions:

- Not addressed.

Transitional procedures:

- Not addressed.

State preemption:

- Not addressed.

Other issues:

- The record also includes four additional documentary submissions by CTIA. Three memorialized meetings with FCC officials: May 6, 1993, with Bryant Merchant, Kathleen Abernathy, Legal Advisors re Dr. Alan Pearce study "British PCN Policy Pitfalls: Implications and Lessons for the U.S.," a copy of which is submitted; May 7, 1993, with Dr. Robert Cleveland, Office of Engineering and Technology; May 20, 1993, with John Cimko, Chief Mobile Services Division, Steve Markendorff, Chief, Cellular Radio Branch, and James Bennett, Chief, Public Mobile Radio Branch re the same study. The July 22, 1993 submission is a CTIA "information kit on its electromagnetic radiation health and safety program" provided to 22 identified commissioners and staff.

CELPAGE, INC.

Comments on RF Environmental Guidelines Amendments
(December 9, 1993)

Interest: Celpage comments as a private carrier paging and radio common carrier licensee that operates paging facilities "throughout the Commonwealth of Puerto Rico, and the Southeastern United States," upon which the proposed changes "are likely to have an immediate impact" (1-2)

Adoption of 1992 ANSI/IEEE Standard:

- Celpage describes the proposal and issues where the FCC has requested comment but does not declare any position (2-4) its only substantive request is for preemption of state and local regulations (4-8).

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.

Controlled v. Uncontrolled environment:

- Not addressed.

Measurement and compliance procedures:

- Not addressed.

Categorical exclusions:

- Not addressed.

Transitional procedures:

- Not addressed.

State preemption:

- "FCC should, in this rulemaking proceeding, expressly preempt all state and local RF regulations" (4-8).

- Celpage discusses Puerto Rico regulations which respond to "health hazard" concerns. Those rules, adopted over Celpage objections, require "all FCC licensees" to obtain a "certificate" from a Puerto Rico "permit-issuing authority" prior "to operating any radio transmitter" and require "extremely complicated, and unnecessary, engineering studies" prior to "using a new transmitter site" or adding a transmitter at an existing site. They impose "enormous expense and compliance burdens" on "radio paging and cellular telephone." Celpage asserts that it would be unreasonably burdensome on licensees and equipment manufacturers if local regulation emerged widely (4-6).

- Celpage argues that FCC has authority to preempt, because a patchwork of state regulation would adversely and "substantially affect the conduct or development of interstate communications" (7-8).

Other issues:

- Not addressed.

COHEN, DIPPELL AND EVERIST, P.C.
Comments on RF Environmental Guidelines Amendments
(January 11, 1994; January 25, 1994)

Interest: Washington, D.C. "consulting engineering firm" directs comments generally to "those aspects" which "impact broadcast facilities" (1). The January 25 filing notes two points as a supplement (S).

Adoption of ANSI/IEEE Standard:

- Adopting the 1992 guidelines could "further the objectives of NEPA" (1).

Induced currents:

- See measurement and compliance procedures.

Contact currents:

- See measurement and compliance procedures.

Controlled v. Uncontrolled environment:

- "Tower rigging crews and qualified engineering staff" should be eligible "to work under 'controlled' conditions at and around broadcast facilities" (5).

- Hand-held devices should be included under uncontrolled guidelines (5).

Measurement and compliance procedures:

- Complains about and requests resolution of conflicting application or interpretation within the FCC as to compliance policies. Uses example that part of the FM Branch uses an EPA model rather than OST 65.(2-3).

- Suggests compliance prediction methods should be updated and "contained under Sections 1.1301-1.1319 of the Commission's Rules" (rather than in publications like OST 65) (3-4).

- Urges that measurements with validated instruments by competent professionals "supersede any calculated evaluation" of facilities, and "measurements or prediction methods should take precedence over personnel monitors until their effectiveness and accuracy have been verified" (4).

- Urges "caution" on implementing the proposed rules for "induced and contact RF currents," because of uncertainties about measurement techniques. In the meantime, rely on "prudent avoidance or reduction in power" (4-5).

- Supports FCC's proposal that would require all stations to carry out evaluations at a multiple use site if one or more operates below 100 MHz (5).

- A simple "no" answer on applications should not be sufficient. CDE urges the Commission to request complete documentation or evidence from the applicants to show compliance with its new RF radiation exposure rules (6).

- Effective April 18, 1990, the Commission in General Docket No. 88-469 adopted a notice that excludes transmitters that do not exceed exposure values less than one percent of the appropriate limits. This firm has found this concept very useful in the analysis of multiuse sites where a number of transmitters are present. CDE believes this analysis tool should be continued to be permitted with the adoption of the revised Commission exposure guidelines (S, 1).

Categorical exclusions:

- "Supports stricter limitations on the exclusions for low power devices" (6).

- "Categorical exclusions should be only limited to those situations where there is clearly no possibility of excessive exposure to workers" (6).

Transitional procedures:

- The stations should be asked to show compliance at the time of their license renewals or if they file an application for modification of facilities. Any new application may be evaluated based on the new rules (6).

- The adoption of the new exposure guidelines could result in licensed operations which have previously complied with Commission radio frequency exposure guidelines now becoming non-compliant. If other alternatives are foreclosed by reason of FAA constraints, revised zoning, other hurdles, etc. not within the control of the licensee, then other provisions of the FCC Rules such as allocation rules should be waived on a case-by-case basis. It is imperative that such broadcast stations, whether AM, FM, or TV, be afforded the maximum opportunity to comply with new exposure guidelines including the flexibility of changing site without additional burden of meeting allocation criteria adopted subsequently (S, 2).

State Preemption:

- Recommends that if ANSI/IEEE C95.1-1992 is adopted, the FCC should "preempt state and local jurisdiction in the administration of the regulation" to ensure "consistent application" (3).

Other issues:

- Hopes FCC's expressed intent to confer with NTIA will help resolve perceived conflicting policies on communications environmental regulation and assessment among the Bureau of Land Management, Forest Service and the Occupational Safety and Health Administration (2).

JULES A. COHEN & ASSOCIATES, P.C.
Comments on RF Environmental Guidelines Amendments
(January 25, 1994)

Interest: Jules Cohen & Associates, P.C., Consulting Electronics Engineers (JC&A) is the successor to firms that, since 1952, have provided consulting engineering services to the telecommunications industry in general, and particularly to broadcasters (1).

Adoption of 1992 ANSI/IEEE Standard:

- JC&A supports the Commission's proposal to use the new standard for RF exposure approved by the Institute of Electrical and Electronic Engineers (IEEE) September 26, 1991, and adopted by the American National Standards Institutes (ANSI) November 18, 1992, identified as ANSI/IEEE C95.1-1992, for evaluating the environmental effects of the emitters that the Commission authorizes. Those standards are, in some respects, more stringent than the 1982 standard now used by the Commission for evaluating environmental effects and, in addition, impose new limitations, particularly in the matter of induced and contact currents (1).

- Both IEEE and ANSI procedures provide for making changes without the requirement to follow the entire process for standards approval so long as the changes do not make basic modifications in essential elements of the standard. It is understood that the type of change described here is recognized by issuance of a supplement to the standard until, in a new printing, the modifications can be incorporated in the body of the standard. The Commission is urged to recognize and accept such changes without the necessity of a formal rulemaking (2).

- The differential between the NCRP/IRPA and ANSI/IEEE protection guides is not determinable without consideration also of averaging time. The result of doing so is that, over most of the applicable range, the energy absorption allowed by ANSI/IEEE is far less than allowed by NCRP/IRPA (8-9).

- Another difference is that NCRP requires use of the general population criterion even for the workplace if the exposure is to carrier frequencies modulated at a depth of 50 percent or greater at frequencies between 3 and 100 Hz. This is a requirement that has no practical application. Broadcast transmitters are not modulated at these frequencies at a depth of 50 percent or greater except for very short intervals. Consequently, the circumstances do not arise that would trigger the requirement to use the stricter standard in a controlled environment (9).

- A further reason for favoring ANSI/IEEE over NCRP/IRPA is the process used in the development. Only ANSI/IEEE is an open process permitting the participation

of anyone who might make a contribution to the effort. Participation in NCRP and IRPA are by invitation only (9).

Induced currents:

- At many multiple use sites as well as at single station sites the ground level electric field is quite low relative to the MPEs. At such sites, induced current measurements should not be required (7).

- With respect to currents in tower climbers, cited references permit a determination of what circumstances permit a worker to climb an energized tower without exceeding MPE limits (8).

Contact currents:

- Contact currents depend, not only on the ambient electric field and the grounding of the person, but also on the size, shape and orientation of the object being contacted. As more data are collected on contact currents under a range of conditions, perhaps guidelines can be adopted suggesting the circumstances not requiring contact current measurements. Meanwhile, judgments will have to be made on a case-by-case basis relative to the need for contact currents (8-9).

Controlled v. Uncontrolled environment:

- The interiors of buildings devoted exclusively to the housing of broadcast transmitters, where access is permitted only to persons concerned with operation and maintenance of those transmitters, clearly fall into the controlled category. Similarly, the immediate vicinity of a transmitting antenna, with at least posting warning of the presence of radiofrequency energy, is also a controlled environment complying with the criteria of "other cognizant persons." Nearby areas, where only "transient passage" of persons is to be expected likewise justify a controlled environment classification. Additionally, transmitter sites located in relatively inaccessible areas may be considered to be within controlled environments so long as they are posed (3).

- An instance where the uncontrolled environment classification should be applied in the workplace is in offices and studios. In such places, neither employees nor visitors to the facilities would have an expectation of exposure to relatively high levels of radiofrequency energy and the lower maximum permissible exposures (MPEs) of the uncontrolled environment standard should apply (3).

- Portable transmitters are used widely, particularly for news gathering. The operators of those transmitters are persons exposed to radiofrequency fields "as a concomitant of employment" and controlled environment criteria apply. Persons

nearby, not employed in the operation, require protection on an uncontrolled environment basis; however, in consideration of the low-power used in portable devices, such as hand-held transceivers, exposure of the public to levels in excess of uncontrolled environment MPEs is highly unlikely. Licensees should provide guidance to employees engaged in transmissions from remote locations as to the need, if its exists, to maintain appropriate spacing from the transmitting devices to nearby persons (3-4).

Measurement and compliance procedures:

- Based on discussions in IEEE Subcommittee IV, radiated power is expected to be defined as "power radiated into space in the absence of nearby objects." Whether a manufacturer proposes exclusion based on either radiated power or SAR, the authorization process should contain a requirement that the specifications for the device include maximum rated radiated power and/or SAR in the body of the user when employed in a prescribed manner. The manufacturer should describe the procedure followed in determining either radiated power or SAR, including a description of the antenna range or laboratory and the qualifications of the personnel conducting the tests (4).

- With respect to the new requirement of the 1992 ANSI/IEEE guidelines regarding the maximum exposure to induced and contact RF currents from 3 kHz to 100 MHz, the Commission proposal in paragraph 22 of the Notice appears to be reasonable, i.e., at multiple use sites all FM broadcast stations regardless of frequency should be considered (7).

- The use of ANSI/IEEE C95.3-1992, "Recommend Practices for the Measurement of Potentially Hazardous Electromagnetic Fields" as guidance for the making of measurements is appropriate. Like C95.1-1992, the measurement document is also subject to revision and the latest edition should be employed. C95.3 has useful information relative to measurement equipment together with warnings about the appropriate instrumentation for different circumstances (10).

- Although major manufacturers of measuring equipment are now offering induced current meters, little experience is available for their evaluation. It is expected that adoption of the 1992 ANSI/IEEE standard will spur the manufacturers to increase their efforts and provide documentation as to the accuracy and reliability of their products (10).

- Protective clothing appears to offer considerable help in complying with protection standards in instances where work in the vicinity of energized antennas is imperative. A recently introduced material consisting of polyester and stainless steel threads in a cotton wrap has been tested extensively and endorsed by the Occupational Safety and Health Administration (OSHA) as providing compliance

with ANSI at power densities of 20 mW/cm for frequencies to 60 MHz and at power densities of 125 mW/cm for frequencies from 65 MHz to 10 GHz. In addition, the study sponsored by the Commission has shown that some work gloves used by tower climbers can be beneficial in reducing body currents (10).

Categorical exclusions:

- The Commission's proposal to exclude "only those low-power devices that meet the uncontrolled guidelines" is inconsistent with the standard. The radiated power criterion of the standard recognizes that sufficiently low radiated power satisfies the SAR criterion on which the standard is based. Therefore, whether compliance of the device with the standard is based on radiated power or SAR, the same controlled/uncontrolled considerations apply (4).

- Continued categorical exclusion of most facilities authorized under Part 74 of the Commission's rules is justified. Present exclusions include: remote pickup and low-power auxiliaries; aural broadcast studio-transmitter links, inter-city relays and microwave booster stations; television broadcast auxiliary stations; low power auxiliary stations; and low-power FM broadcast translator and FM booster stations. The rationale for specific categories is presented (5-7).

Transitional procedures:

- Devices now in use under the 1992 ANSI standard should be allowed to be continued in use of their normal lifetime. No expectation exists that currently used low-power devices constitute a risk to the user even if future restrictions are to be more stringent. Furthermore, the sale of presently available stocks and devices that might be manufactured for a year after adoption of the change in Commission standards should be allowed to be judged on the basis of the 1982 standard. Within one year, manufacturers should be required to submit new requests for authorization based on the 1992 standards and, after one year, devices should include a certification of compliance with the low-power exclusion clause based on either radiated power or SAR (4-5).

- Demonstration of compliance with the new standard should be required for all applications for new facilities, changed facilities and license renewal 60 days after the effective date of the change in order to avoid the need to rework applications in process. Furthermore, as in the case of the present standard, the effective date should be set after the development of a revised edition of OST Bulletin No. 65 so that adequate guidance is available for applicants (9).

State preemption:

- Not addressed.

Other issues:

- Not addressed.

MEMBERS OF THE AARL BIO-EFFECTS COMMITTEE

Comments on RF Environmental Guidelines Amendments
(January 7, 1994)

Interest: Four individuals (Ivan Shulman, M.D., Chair, W. Ross Adey, M.D., Wayne Overbeck, Ph.D., David J. Rodman, M.D.) appointed by the American Radio Relay League "Board of Directors to provide advice to the Board concerning the possible health considerations involved in various amateur radio activities" comment as "amateur radio licensees" that "are actively engaged in medical research in this field" (1). Dr. Overbeck also has commented individually.

Adoption of ANSI/IEEE Standard:

- They criticize the ANSI/IEEE 1992 standard "in the strongest possible terms" for failing to consider "the effect of low-frequency modulation, pulsing and keying of radio frequency signals, and the growing body of evidence that athermal [e]ffects of electromagnetic energy must be taken into account" (6-7). The athermal effects evidence is summarized in Dr. Adey's attached 1993 paper, entitled "Mechanisms Mediating Athermal Bioeffects of Nonionizing Electromagnetic Fields."

- They charge that "the ANSI/IEEE guidelines appear to have become a refuge for special interests for whom the very existence of health problems at athermal levels of exposure would have important (and costly) consequences" (7).

- They note that some "public and private sector organizations" are adopting occupational exposure levels that are lower than the ANSI/IEEE uncontrolled levels (8).

- If C95.1-1992 is to be adopted by the Commission at all, its standard for uncontrolled environments is the least stringent standard that the Commission ought to consider using in its environmental review of licensees (8).

Induced currents:

- Not addressed.

Contact currents:

- Not addressed.